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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,931	04/15/2004	Michael M. Thackeray	ANL 268	9040
43008	7590	05/10/2007		
HARRY M. LEVY OLSON & HIERL, LTD. 20 North Wacker 36th Floor CHICAGO, IL 60606-4401			EXAMINER KALAFUT, STEPHEN J	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 05/10/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/825,931	Applicant(s) THACKERAY ET AL.	
	Examiner Stephen J. Kalafut	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>03 Dec 2004</u> . | 6) <input type="checkbox"/> Other: ____. |

Art Unit: 1745

Claims 14-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent for "the $x\text{Li}_2\text{M}'\text{O}_3 \cdot (1-x)\text{LiMO}_2$ electrode" in claim 14, because its parent claim 1 does not recite this formula. Claims 15-19 depend from claim 14, and would likewise be indefinite.

Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. If the Li^+ ions are partially exchanged for H^+ ions, the resulting material would no longer fit into the formula of parent claim 1.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 9-13, 19, 23-27 and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Murai *et al.* (US 5,316,875).

Art Unit: 1745

Murai *et al.* disclose batteries with cathode materials such as LiMnO_2 , LiCoO_2 , LiNiO_2 and LiFeO_2 (column 1, lines 48-51). These would correspond to the present coefficient “x”, in the formulas of claims 1, 9, and 24-27 being zero, the coefficient delta being zero, and M being Mn, Co, Ni or Fe. The element M’ would not be present where “x” is zero. Recitations of how the present materials were made are treated under product-by-process practice, *in re Fitzgerald* 205 USPQ 594, and would not *per se* distinguish. See MPEP 2113 and the cases cited therein. For example, because the “proton-containing medium” recited in claims 9 and 31-35 is not part of the cathode material product, recitations to the nature of this medium do not distinguish. Claim 19 and 23 are also in product-by-process format, and would read on the cathode of Murai *et al.*, no matter how it was made.

Claims 1-13, 19, 23-27 and 31-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Thackeray *et al.* (US 6,680,143).

Thackeray *et al.* disclose batteries with cathode materials having the general formula $x\text{LiMO}_2 \cdot (1-x)\text{Li}_2\text{M}'\text{O}_3$, where $0 < x < 1$. M comprises Mn, Ni, Co, Ti or V, while M’ comprises Mn, Ti or Zr. Thus, M and M’ would respectively correspond to the present M and M’. See column 3, lines 27-41 and figure 3. The coefficient “x” in Thackeray *et al.* would correspond to “1-x” in present claims 9, 25 and 27, while the formula in claims 1, 24 and 26 would represent the same relative proportions of the two complex oxides. The formula of Thackeray *et al.* would also correspond to the present coefficient delta being zero. The Li^+ may also be partially replaced by H^+ (column 5, lines 5-8), which would correspond to the coefficient “y” in claims 28-30 being between zero and one. Recitations of how the present materials were made are

Art Unit: 1745

treated under product-by-process practice, *in re Fitzgerald* 205 USPQ 594, and would not *per se* distinguish. See MPEP 2113 and the cases cited therein. For example, because the “proton-containing medium” recited in claims 9 and 31-35 is not part of the cathode material product, recitations to the nature of this medium do not distinguish. Claims 19 and 23 are also in product-by-process format, and would read on the cathode of Thackeray *et al.*, no matter how made.

Claims 1-13, 19 and 23-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Thackeray *et al.* (US 6,677,082).

Thackeray *et al.* disclose batteries with cathode materials having the general formula $x\text{LiMO}_2 \cdot (1-x)\text{Li}_2\text{M}'\text{O}_3$, where $0 < x < 1$. M comprises Mn, Ni, Co, Ti or V, while M' comprises Mn, Ti or Zr. Thus, M and M' would respectively correspond to the present M and M'. See column 2, line 63 through column 4, line 10, and figure 3. The coefficient “x” in Thackeray *et al.* would correspond to “1-x” in present claims 9, 25 and 27, while the formula in claims 1, 24 and 26 would represent the same relative proportions of the two complex oxides. The formula of Thackeray *et al.* would also correspond to the present coefficient delta being zero. The Li^+ may also be partially replaced by H^+ (column 3, lines 52-56), which would correspond to the coefficient “y” in claims 28-30 being between zero and one. Recitations of how the present materials were made are treated under product-by-process practice, *in re Fitzgerald* 205 USPQ 594, and would not *per se* distinguish. See MPEP 2113 and the cases cited therein. For example, because the “proton-containing medium” recited in claims 9 and 31-35 is not part of the cathode material product, recitations to the nature of this medium do not distinguish. Claims

Art Unit: 1745

19 and 23 are also in product-by-process format, and would read on the cathode of Thackeray *et al.*, no matter how made.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-13, 19, 23-27 and 31-35 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13, 17 and 18 of U.S. Patent No. 6,680,143. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter discussed above, with regard to the rejection under §102(e) is also recited in the patented claims. In the patented claims, note the general formula in claim 1; the metals for M and M' in claims 5-7 and 11-13; and H⁺ ions in claim 10.

Art Unit: 1745

Claims 1-13, 19, 23-27 and 31-35 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,677,082. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter discussed above, with regard to the rejection under §102(e) is also recited in the patented claims. In the patented claims, note the general formula in claims 1 and 14-16; the metals for M and M' in claims 5-7, 11 and 12; and H⁺ ions in claim 15.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thackeray *et al.* (either '143 or '082, both above).

The presence of acidic species in the electrolyte, noted by both Thackeray *et al.* patents as causing H⁺ to partially replace Li⁺, would mean that the electrolyte is a proton-containing medium with a pH of less than 7. These claims differ from Thackeray *et al.* by reciting the duration and temperature for heating the electrode material. However, since the claims only recite maxima for these parameters, claims 20 and 21 would read on merely storing the battery at room temperature. While not explicitly disclosed by Thackeray *et al.*, storing batteries for later use is an obvious expedient not only to the ordinary artisan, but also to the ordinary consumer after buying the battery. For this reason, these claims would be obvious over either patent to

Art Unit: 1745

Thackeray *et al.* Regarding claim 22, selection of an appropriate acidic species would be within the skill of the artisan reading the teachings of Thackeray *et al.*, as stated in '143, column 5, lines 5-8 or in '082, column 3, lines 52-56. Claim 23 would recite the product resulting from the storing at room temperature encompassed by claim 20.

Claims 14-18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not disclose the present method of subjecting an electrode material of the formula $x\text{Li}_2\text{M}'\text{O}_3 \cdot (1-x)\text{LiMO}_2$ and subjecting it to a reducing environment at a temperature between about 150 °C and about 1000 °C.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Maruta (US 6,335,119) discloses a method of making a battery cathode material, in which a complex oxide containing lithium and hydrogen is used as a starting material. Tabuchi et al. (US 6,720,111) disclose a cathode material comprising a solid solution lithium ferrite and an iron-doped lithium complex oxide.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

sjk



STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700